LISTING OF THE CLAIMS

There are no amendments to the claims in this submission and the current listing of the claims in this application as amended July 22, 2003 is presented below.

1. (Previously Amended) A method of minimizing oil consumption in a gas turbine engine, by avoiding reliance on air intake into the engine oil circuit for bearing chamber oil sealing purposes, the engine having an oil circuit including:

a plurality of bearings supporting at least one shaft along the shaft;

a bearing chamber enveloping each said bearing and maintaining a volume of oil with an oil-air interface in communication with a volume of air therein; and

oil circulation means in flow communication with each bearing chamber for supplying a flow of oil to a bearing chamber inlet and for evacuating spent oil from an outlet of the bearing chamber;

characterized in that, the method comprises:

sealing each bearing chamber with a hydropad seal disposed in sealing relation between the shaft and bearing chamber, the hydropad seal comprising an annular ring mounted to the shaft and an annular pad mounted to the chamber, the ring and pad having abutting seal surfaces;

rotating the ring during engine operation to cast oil radially outwardly from said shaft axis toward an outer periphery of the bearing chamber under centrifugal force;

collecting oil from the outer periphery of the bearing chamber and directing oil flow to the bearing chamber outlet.

2. (Original) A method according to claim 1 wherein the oil circulation operates independently of an oil-air separation function and an air venting function.

3. (Original) A method according to claim 1 wherein the abutting sealing surfaces of the hydropad remain engaged in frictional sealing relation below a lift off rotary speed.

4. (Original) A method according to claim 3 wherein the abutting sealing surfaces of the hydropad disengage when rotary speed exceeds the lift off rotary speed, the ring sealing surface casting oil outwardly under centrifugal force to impede oil passage through the hydropad seal.

5. (Previously Amended) A method according to claim 1 wherein cast oil is collected from the outer periphery of the bearing chamber using an oil scavenge pump in communication with the bearing chamber.

6. (Previously Amended) A gas turbine engine that reduces air intake into the engine oil circuit for bearing chamber oil sealing purposes, the engine having an oil circuit including:

a plurality of bearings supporting at least one shaft along the shaft;

a bearing chamber enveloping each said bearing and maintaining a volume of oil with an oil-air interface in communication with a volume of air therein; and

oil circulation means in flow communication with each bearing chamber for supplying a flow of oil to a bearing chamber inlet and for evacuating spent oil from an outlet of the bearing chamber;

characterized in that, the engine comprises:

a hydropad seal disposed in sealing relation between the shaft and a bearing chamber, the hydropad seal comprising an annular ring mounted to the shaft and an annular pad mounted to the chamber, the ring and pad having abutting seal surfaces;

turbine means mounted to the shaft for rotating the ring during engine operation to cast oil radially outwardly from said shaft axis toward an outer periphery of the bearing chamber under centrifugal force; and

wherein the oil circulation means includes oil scavenge means for collecting oil from the outer periphery of the bearing chamber and directing oil flow to the bearing chamber outlet.

7. (Original) An engine according to claim 6 wherein the oil circulation means operate independently of an oil-air separation function and an air venting function.

8. (Original) An engine according to claim 6 wherein the abutting sealing surfaces of the hydropad remain engaged in frictional sealing relation below a lift off rotary speed.

9. (Original) An engine according to claim 8 wherein the abutting sealing surfaces of the hydropad disengage when rotary speed exceeds the lift off rotary speed, wherein the ring sealing surface casts oil outwardly under centrifugal force to impede oil passage through the hydropad seal.

10. (Previously Amended) An engine according to claim 6 wherein the oil scavenge means include an oil scavenge pump in communication with the bearing chamber.

11. (Previously Presented) A method according to claim 1 including:

retaining oil within the bearing chamber, independently of any gas pressure differential across the abutting seal surfaces of the ring and pad by rotating the ring

during engine operation to cast oil radially away from the seal surfaces toward the outer periphery of the bearing chamber under said centrifugal force.

12. (Previously Presented) An engine according to claim 6 wherein the turbine means are mounted to the shaft for retaining oil within the bearing chamber, independently of any gas pressure differential across the abutting seal surfaces of the ring and pad by rotating the ring during engine operation to cast oil radially away from the seal surfaces toward the outer periphery of the bearing chamber under said centrifugal force.

13. (Previously Presented) A breather-less oil system for a gas turbine engine comprising:

an oil system adapted to supply pressurized oil to and evacuate oil from a plurality of bearing chambers, the bearing chambers each having at least one oiled bearing therein supporting a rotatable component and at least one air-oil interface defined between a volume of oil within the chamber and a volume of air outside the chamber; and

a plurality of hydropad seals, wherein all of said air-oil interfaces are sealed by hydropad seals such that in use the hydropad seals permit air to enter and to exit the oil system, thereby permitting the oil system to be operated independent of an air breather apparatus.

14. (Previously Presented) A method of reducing oil consumption in a gas turbine engine having a main oil system communicating with a plurality of bearing compartments, the oil system adapted to feed oil to and remove oil from oiled bearings in the bearing chambers, each bearing chamber having an air-oil interface being defined between oil contained therein and air outside the compartment, the method comprising the step of:

reducing a net airflow into the main oil system through the air-oil interfaces by sealing each air-oil interface with a hydropad seal between the shaft and the chamber.

15. (Previously Presented) A method according to claim 14 wherein the method further comprises the step of removing an air breather from the main oil system.